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Resumen

Como parte del Plan de Acción de Biodiversidad que desarrolla Minera Panamá y el Jardín Botánico de Missouri (MBG) se publicaron dos especies nuevas, *Annona caesia* G. E. Schatz, C. Ramos &. O. Ortiz y *Dendropanax pachypedunculatus* Idárraga & Lowry.

Cabe resaltar que en ambas publicaciones se hicieron en conjunto con botánicos panameños y del Jardín Botánico de Missouri, de esta manera Minera Panamá continua su aporte a las capacidades científicas del país.

Schatz, G., C. Ramos, O. Ortiz & G. McPherson. 2015. A New, Restricted Range Species of Annona (Annonaceae) Endemic to the Caribbean Slope of Panama. Novon 24: 203–208.

Annona caesia G. E. Schatz, C. Ramos & O. Ortiz es descrita de los bosques de tierras bajas de la vertiente del Caribe de Panamá. Esta especie nueva se diferencia de otras especies de *Annona* L. (Annonaceae) con flores medianas a grandes y ampliamente ovoides (incluyendo otras tres especies en Panamá: *A. acuminata* Saff., *A. billbergii* R. E. Fr. *y A. spraguei* Saff.) por tener hojas con el envés glabro, glauco-azuloso y presentar pétalos internos reducidos. De acuerdo a las categorías y criterios de la Lista Roja de la UICN, el estado de conservación de *A. caesia* es Vulnerable (VU).

Idárraga, P. Lowry & J. De Gracia. 2015. A New Species of Dendropanax (Araliaceae) of Restricted Range from the Caribbean Slope of Panama. Novon 24:165–169.

Dendropanax pachypedunculatus Idárraga & Lowry (Araliaceae) es una nueva especie descrita de los bosques de tierras bajas en la región de Donoso, provincia de Colón, a lo largo de la vertiente Caribe de Panamá. Esta especie está relacionada con *D. arboreus* (L.) Decne. & Planch., la cual se diferencia por sus frutos más grandes, ejes primarios de la inflorescencia y pedúnculos más gruesos y la venación pinnada de sus hojas (vs. principalmente triplinervia). Esta nueva especie es conocida sólo de una colección hecha dentro de la huella de un proyecto minero de cobre. Una evaluación preliminar del riesgo de extinción utilizando las categorías y los criterios de listas rojas por IUCN indica que *D. pachypedunculatus* debería ser considerada como críticamente amenazada (CR).

A New, Restricted Range Species of *Annona* (Annonaceae) Endemic to the Caribbean Slope of Panama

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Abstract. *Annona caesia* G. E. Schatz, C. Ramos & O. Ortiz is described from the lowland forests of the Caribbean slope of Panama. The new species differs from other *Annona* L. (Annonaceae) by the medium to large, broadly ovoid flowers (including three other species in Panama: *A. acuminata* Saff., *A. billbergii* R. E. Fr., and *A. spraguei* Saff.), by the glabrous and bluish glaucous underside of its leaves, and by the presence of small inner petals. The conservation status according to IUCN Red List categories and criteria has been assessed as Vulnerable (VU).

Resumen. *Annona caesia* G. E. Schatz, C. Ramos & O. Ortiz es descrita de los bosques de tierras bajas de la vertiente del Caribe de Panamá. Esta especie nueva se diferencia de otras especies de *Annona* L. (Annonaceae) con flores medianas a grandes y ampliamente ovoides (incluyendo otras tres especies en Panamá: *A. acuminata* Saff., *A. billbergii* R. E. Fr. y *A. spraguei* Saff.) por tener hojas con el envés glabro, glauco-azuloso y presentar pétalos internos reducidos. De acuerdo a las categorías y criterios de la Lista Roja de la UICN, el estado de conservación de *A. caesia* es Vulnerable (VU).

Key words: *Annona*, Annonaceae, Colón, IUCN Red List, Panama.

With the inclusion of the genera *Raimondia* Saff., *Rollinia* A. St.-Hil., and *Rolliniopsis* Saff. (Rainer, 2001, 2007), the genus *Annona* L. (Annonaceae) now comprises ca. 160 species, the majority of which are distributed throughout the Neotropics from the United States (Florida) to Bolivia and Paraguay and the West Indies, with only three species in Africa, one of which extends to Madagascar (Rainer & Chatrou, 2014). *Annona* is most easily recognized in the Neotropics by its mostly simple hairs and mostly syncarpous fruit, with several species commonly cultivated for their edible fruit (*A. cherimola* Mill., *A. macroprophyllata* Donn. Sm., *A. mucosa* Jacq., *A. muricata* L., *A. reticulata* L., *A. squamosa* L.). Floral morphology varies substantially within *Annona* and has served as the basis for sectional classification within the genus beginning with Safford (1911, 1913, 1914) and continuing with Fries (1931), prior to the inclusion of the winglike petals of *Rollinia* and *Rolliniopsis*. When treated for the *Flora of Panama* (Fries, 1962), only five indigenous species of *Annona* were recorded. The upcoming *Flora Mesoamericana* treatment (Schatz & Rainer, in prep.) will recognize 14 indigenous species of *Annona* in Panama, including the new species here described.

Recent botanical inventory work conducted in the Donoso Region of Panama, in support of an environmental impact assessment and biodiversity management program for a large copper mining project being implemented by Minera Panama S.A. (MPSA), has revealed the presence of a diverse and interesting flora in this previously underexplored part of the Caribbean slope (MPSA & Missouri Botanical Garden, 2014). Several new species have been described based on collections resulting from this work, including *Aphelandra merelloae* T. F. Daniel &

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McPherson (Acanthaceae), *Blakea unguiculata* Almeda & Penneys (Melastomataceae), *Cryptocarya panamensis* P. L. R. Moraes & van der Werff (Lauraceae), *Miconia mcphersonii* Almeda & Penneys (Melastomataceae), *Pleurothyrium triflorum* van der Werff (Lauraceae), *Posoqueria laevis* C. M. Taylor (Rubiaceae), and *Strychnos puberula* McPherson (Loganiaceae). Here we describe another novelty from the Caribbean slope of Panama.

Annona caesia G. E. Schatz, C. Ramos & O. Ortiz, sp. nov. TYPE: Panama. Colón: Zona de Concesión Minera Panamá, sitio Presa Este, 08°52′17″N, 80°38′50″W, 102 m, 9 Dec. 2013 (fl.), *R. Flores & A. Delgado 3545* (holotype, PMA; isotypes, FT, MO, SCZ, UCH, US, WU). Figures 1, 2.

Diagnoses. *Annona caesia* G. E. Schatz, C. Ramos & O. Ortiz is distinguished by the glabrous and bluish glaucous underside of the leaves, the broadly ovoid flowers, the sepals with a mucronate apex, the six petals in two very unequal whorls, the outer petals thick, concave with a triangular bilobed food body on the inner surface, the inner petals thin to 1/4 the length of the outer petals, and the fruit surface areolate and slightly muricate, bluish glaucous.

Se distingue por tener hojas con el envés glabro y glauco-azuloso, flores ampliamente ovoides, sépalos con el ápice mucronado, pétalos (seis) arreglados en dos verticilos desiguales, pétalos externos gruesos, cóncavos con un cuerpo alimenticio triangular bilobado en la superficie interna, pétalos internos delgados, reducidos a 1/4 de la longitud de los pétalos externos y la superficie del fruto areolada, ligeramente muricada, glauco-azulosa.

Trees 6–10 m tall; young branches sparsely covered with appressed simple whitish hairs, soon glabrate, internodes 0.5–5.5 cm, lenticels circular to oblong. Leaves with the petiole (5–)9–13(–18) mm, 1.4–2.3 mm diam., canaliculate adaxially, light brown, with short, scattered, simple whitish, appressed hairs, soon glabrate; lamina 12–32.5 × 3.7–14 cm, broadly elliptic to slightly obovate, the first leaf of a growth shoot usually much smaller, 2–4.3 × 1.4–2 cm, thinly chartaceous, bluish glaucous below, glaucous bloom rubbing off lower surface to the touch, upper lamina surface glabrous except for moderately dense, simple, erect, and somewhat twisted, whitish hairs ca. 1 mm along the midvein, lower surface glabrous except for scattered, short (< 1 mm), simple, whitish hairs on the midvein, secondary veins, and margin, lamina apex acuminate to cuspidate, the acumen 1.5–4 cm, base acute to obtuse to nearly rounded, margin flat to slightly revolute near base, midvein prominently and secondary veins slightly impressed above, higher-order venation flat above, midvein prominently raised below, secondaries and tertiaries less so, midvein and secondary veins orange-tan below, (9 to)11 to 24 secondary veins per side, emerging at an angle of ca. 45°, gradually curved toward margin, some adjacent secondaries connecting near margin but some not, i.e., the venation weakly brochidodromous, intersecondary veins present but short, tertiary venation somewhat but not prominently percurrent, domatia absent. Inflorescenses internodal, emerging 5–7 mm above subtending leaf, flowers solitary, broadly ovoid, pedicels cylindrical, 6–7 mm, 1 mm diam., glaucous, densely covered with short, appressed, simple white hairs, subtended by a shortly stalked, foliaceous, cucullate bract, 4 × 3 mm, ovate, membranous, apex acuminate, light tan with visible venation, densely covered with short, appressed, golden hairs, caducous, bearing a smaller pedicellar bract emerging midway from base, 2 × 1 mm, narrowly triangular, light tan, densely covered with short, appressed, golden hairs, caducous or sometimes persistent. Flowers with 3 sepals, entirely fused to adjacent sepal, or sometimes adjacent sepals free, 6 × 4 mm, broadly ovate, persistent in fruit, apex mucronate, mucro to 1.3 mm, abaxially moderately to densely covered with appressed short hairs, more densely so toward apex and on mucro, somewhat glabrescent in fruit, glabrous adaxially, with scattered stiff, golden hairs 1–1.5 mm adhering to base of sepals adaxially from ring of hairs subtending outer whorl of petals; corolla subtended by a ring of stiff, erect, golden hairs 1–1.5 mm; petals 6 in 2 unequal whorls, inner whorl much smaller than outer whorl, outer petals 16–18 × 12–15 mm, 2–3 mm thick at apex, broadly ovate, valvate, concave, apex acute, fleshy, in vivo yellow-green outside, greenish cream inside with white striations basally topped by reddish markings in center and a triangular, bilobed, light flesh-colored food body, densely covered both abaxially and adaxially with short, appressed, simple, whitish hairs, with scattered longer, stiff, golden hairs 0.5 mm adhering to base of petals adaxially from ring of hairs subtending androecium; inner petals 4–6 × 2–4 mm, lanceolate, apex acute, light flesh-colored, densely covered with simple, very short, appressed hairs abaxially; androecium subtended by a ring of stiff, erect, golden hairs 0.5 mm; stamens numerous, 3.7 mm, filament 0.8 mm, connective above anther thickened and flattened, discoid to pentagonal or hexagonal, papillate and covered with very short, erect hairs, light flesh-colored; gynoecium subtended

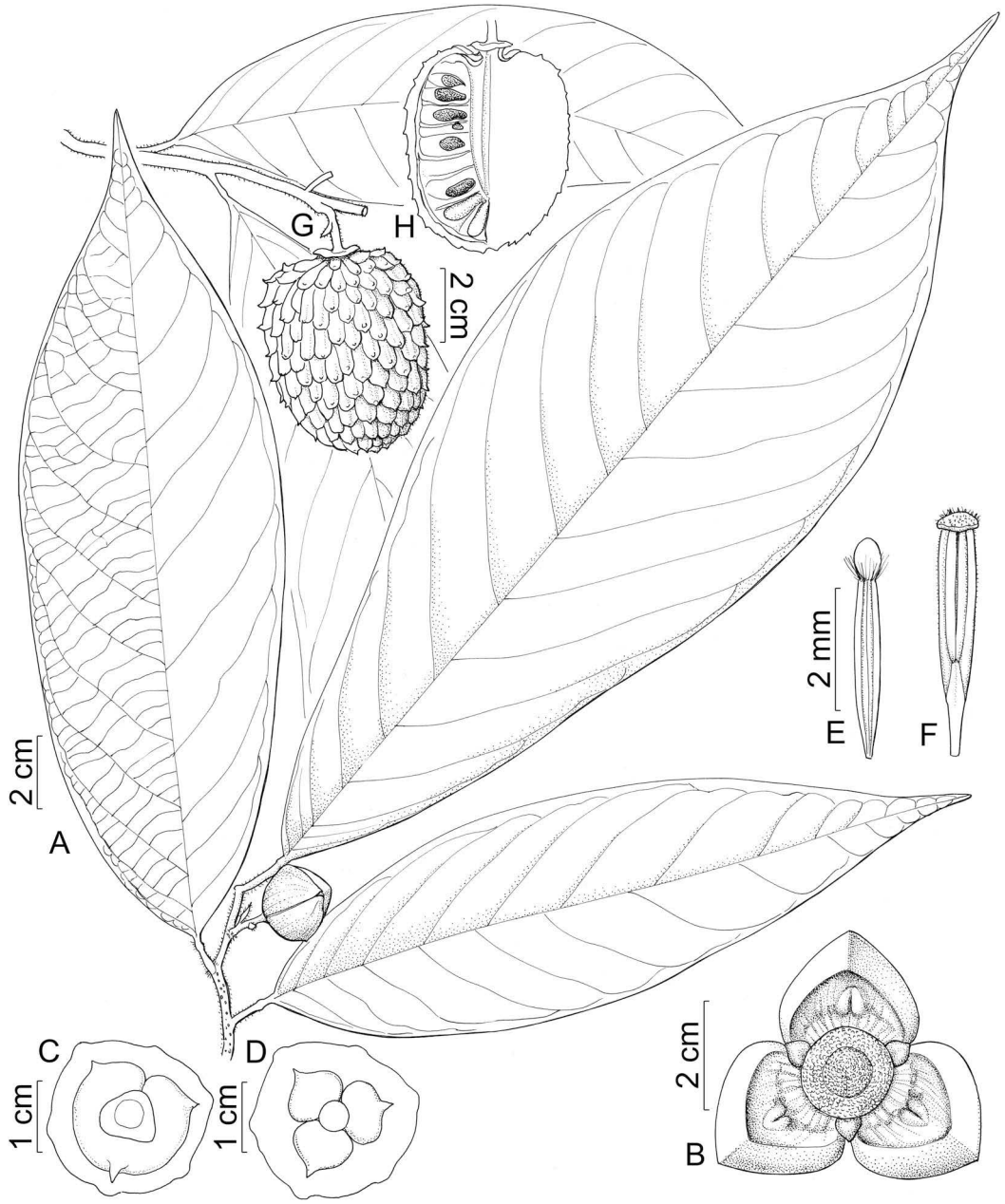

Figure 1. *Annona caesia* G. E. Schatz, C. Ramos & O. Ortiz. —A. Leaves and flower. —B. Interior of a flower showing food bodies on inner surface of outer petals, inner petals, androecium, and gynoecium. —C. Exterior of a flower showing fusion of adjacent sepals forming a partially fused calyx. —D. Exterior of a flower showing a calyx of three distinct sepals. —E. Carpel. —F. Stamen. —G. Fruit. —H. Longitudinally cut fruit showing a single basal seed in each carpel. A–F illustrated from the MO isotype *R. Flores & A. Delgado 3545*; G, H from *R. Flores 2102* (MO).

by a dense ring of stiff, erect, golden hairs 0.5 mm; carpels ca. 320; ovary cylindrical, 3 mm, glabrous, with a tuft of short hairs at apex subtending stigma, stigma 0.5–1 mm, ovoid, fused into a head, white. Fruits (immature) 6 × 3.5 cm, ovoid, of a similar bluish glaucous color as underside of leaves, densely covered with appressed, whitish hairs, surface areolate to slightly muricate, apex of each areole incurved, densely covered with short golden hairs; immature seeds to 8 × 3.5 mm.

Figure 2. *Annona caesia* G. E. Schatz, C. Ramos & O. Ortiz. —A. Flower. —B. Fruit. A photographed in situ from the type *R. Flores & A. Delgado 3545*; B from *R. Flores 1860*.

Habitat and distribution. *Annona caesia* is endemic to Panama and is currently known only from lowland wet tropical forest at elevations between 83 and 478 m in the provinces of Coclé, Colón, and Veraguas.

IUCN Red List category and conservation status. *Annona caesia* has thus far been documented from 15 distinct localities, three of which are within the boundaries of the proposed copper mining footprint and are therefore scheduled for eventual removal. Overall, the known localities define a geographic range for the species in the form of an extent of occurrence (EOO) of 625 km² and an area of occupancy (AOO) of between 60 km² and 625 km²,

depending on the area actually occupied by the species within the EOO, which is unknown. With seven locations in relation to the principal threat from mining activities, the species qualifies for Vulnerable [VU B1ab(ii,iii,iv,v)+2ab(ii,iii,iv,v)] according to IUCN Red List categories and criteria (IUCN, 2012). Fortunately, *A. caesia* has been documented from the existing protected areas of Omar Torrijos National Park and Santa Fé National Park, as well as from the proposed Donoso conservation zone.

Etymology. The specific epithet of this new species refers to the bluish glaucous underside of the leaves and fruit.

Discussion. Using the key to the sections of *Annona* in Fries (1931), the new species would fall into *Annona* sect. *Helogenia* Saff. with six petals, the inner much smaller than the outer (Safford, 1913, 1914). Flowers in section *Helogenia* are similar in size and shape (depressed conical to broadly ovoid with thick, concave, valvate outer petals) to those in *Annona* sect. *Pilanonna* Saff., the latter differing primarily by their lack of inner petals, although occasionally with one to three very small, vestigial inner petal remnants. In Panama, three other species share a similar floral morphology with the new species: *A. acuminata* Saff., *A. billbergii* R. E. Fr. (originally collected in 1826 from "Porto-Bello, in montibus," i.e., presumably inland from Porto Belo, and still known only from its type collection), and *A. spraguei* Saff. Of these, only *A. acuminata* has leaves with a glabrous underside, the underside of the leaves of *A. spraguei* being densely covered with long, erect hairs and those of *A. billbergii* being densely covered with short, appressed hairs. The new species is easily distinguished from *A. acuminata* by its much longer and broader leaves (12–32.5 × 3.7–14 cm in *A. caesia* vs. 1.6–15.3 × 1.2–5 cm in *A. acuminata*) that are bluish glaucous on the underside and lack the domatia present on the underside of the leaves of *A. acuminata*. Moreover, none of the three other Panamanian species possesses inner petals. The new species is also similar in floral and fruit characteristics to recently described *A. prevostiae* H. Rainer from French Guiana (Rainer, 2002); however, the lamina underside of *A. prevostiae* is densely covered with hairs versus the glabrous lamina underside of *A. caesia*. The only other species in either section with glabrous leaf undersides is *A. iquitensis* R. E. Fr., which is a liana from Peru with smaller oblong leaves and flowers with only three petals.

Paratypes. PANAMA. **Cocle:** Distr. La Pintada, Parque Nac. Gen. División Omar Torrijos Herrera, La Rica, área del rio Juan Julio, 08°42′11″N, 80°35′13″W, 24 July 2013 (st.), *R. Flores 3324* (MO, PMA). **Colón:** Distr. Donoso, zona minera E-01, 08°51′52″N, 80°41′28″W, 9 Apr. 2013 (st.), *R. Flores 1860* (MO, PMA); Zona minera E-01, 08°51′52″N, 80°40′33″W, 27 Apr. 2013 (fr.), *R. Flores 2102* (MO, PMA); Coclé del Norte, area del Helipat C10, 08°48′19″N, 80°43′19″W, 26 Aug. 2012 (st.), *L. Martínez 1006* (MO, PMA), Coclé del Norte, área del Helipat C11, 08°56′25″N, 80°38′08″W, 12 Mar. 2010 (st.), *A. Zapata 2530* (MO, PMA); Coclé del Norte, área del Helipat W23, 08°56′16″N, 80°38′32″W, 23 Oct. 2010 (st.), *A. Zapata 2590* (MO, PMA); Coclé del Norte, Helipad Primera corriente 07, rumbo N, próx. Nueva Lucha, ladera del rio Petaquilla, 08°56′18″N, 80°45′44″W, 23 Aug. 2012 (st.), *A. Zapata 2590* (MO, PMA); Teck Cominco Mining Concession, Camp Colina, forests along Quebrada Colina, 08°49′50″N, 80°39′30″W, 3 Mar. 2008 (fl.), *M. Merello & J. Isabel González 3205* (MO, PMA). **Veraguas:** Distr. Santa Fé, área del Rio Piedra, camino a Río Guayabalito, 08°44′11″N, 80°46′58″W, 5 Dec. 2013 (st.), *L. Martínez 1546* (MO, PMA); Santa Fe, Rio Veraguas, área del amortiguamiento del Parque Nac. Santa Fé, orilla del camino que conduce a la quebrada Veraguita, 08°43′14″N, 80°52′08″W, 10 Feb. 2014 (st.), *L. Martínez 1706* (MO, PMA); área del Rio Guayabalito, trocha a Calle Larga, 08°44′23″N, 80°47′22″W, 22 Mar. 2014 (st.), *L. Martínez 1769* (MO, PMA); Parque Nac. Santa Fé, Río Dos Brazos, 08°42′20″N, 80°53′20″W, 6 Feb. 2014 (st.), *A. Morris 2074* (MO, PMA), 08°42′02″N, 80°53′12″W, 7 Feb. 2014 (st.), *A. Morris 2075* (MO, PMA); Límite Norte del Parque Nac. Santa Fé, Rio Dos Brazos, afluente de Río Veraguas, 08°42′02″N, 80°53′05″W, 5 Feb. 2014 (st.), *A. Zapata 3490* (MO, PMA), 08°42′20″N, 80°53′20″W, 250 m, 6 Feb. 2014 (st.), *A. Zapata 3502* (MO, PMA).

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A New Species of *Dendropanax* (Araliaceae) of Restricted Range from the Caribbean Slope of Panama

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Abstract. *Dendropanax pachypedunculatus* Idárraga & Lowry (Araliaceae) is described from lowland forest in the Donoso District of Colón Province along the Caribbean slope of Panama. It most closely resembles *D. arboreus* (L.) Decne. & Planch., from which it can be distinguished by several characters including its larger fruits, thicker primary inflorescence axes and peduncles, and leaves with pinnate (vs. mostly triplinerved) venation. This new species is known from a single collection made within the footprint of a copper mining project. A preliminary risk of extinction assessment using the IUCN Red List categories and criteria indicates that *D. pachypedunculatus* should be considered Critically Endangered (CR).

Resumen. *Dendropanax pachypedunculatus* Idárraga & Lowry (Araliaceae) es una nueva especie descrita de los bosques de tierras bajas en la región de Donoso, provincia de Colón, a lo largo de la vertiente Caribe de Panamá. Esta especie está relacionada con *D. arboreus* (L.) Decne. & Planch., la cual se diferencia por sus frutos más grandes, ejes primarios de la inflorescencia y pedúnculos más gruesos y la venación pinnada de sus hojas (vs. principalmente triplinervia). Esta nueva especie es conocida sólo de una colección hecha dentro de la huella de un proyecto minero de cobre. Una evaluación preliminar del riesgo de extinción utilizando las categorías y los criterios de listas rojas por IUCN indica que *D. pachypedunculatus* debería ser considerada como críticamente amenazada (CR).

Key words: Araliaceae, *Dendropanax*, IUCN Red List, Panama.

Dendropanax Decne. & Planch. (Araliaceae) comprises nearly 100 species of tropical and subtropical evergreen trees and shrubs. The genus exhibits an amphi-Pacific disjunct distribution, with ca. 25 to 30 representatives in Asia and the remainder in Central and South America (Frodin & Govaerts, 2003; Fiaschi, 2005, 2006; Fiaschi & Jung-Mendaçolli, 2006). Within the Neotropics, species diversity in *Dendropanax* is highest in eastern Brazil and southern Central America, with almost 70 species (Cannon & Cannon, 1989; Frodin & Govaerts, 2003; Fiaschi, 2005, 2006; Fiaschi & Jung-Mendaçolli, 2006; Mabberley, 2008; Li & Wen, 2013). Nevling (1959) recognized eight species of *Dendropanax* in Panama, and Cannon and Cannon (1989) added seven new species and one new record for the country (*D. caucanus* (Harms) Harms), but excluded one species restricted to Colombia (*D. dariensis* Seem.) and placed one name in synonym, bringing the total number in Panama to 14 species (see also Cannon & Cannon, 2009).

Species of *Dendropanax* are glabrous and exhibit a hermaphroditic or andromonoecious sexual system. The stems and branches are unarmed, and the leaves are simple and unlobed or palmately 2- or 3-(to 5-) lobed, with margins that are entire or bear a few regular or irregular teeth and with blades that often have translucent yellow or red glandular punctae or schizogenous glands. The inflorescences of *Dendro-*

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panax are terminal, simple or compound umbels (or occasionally racemes of umbels); the 5-(to 9-)merous flowers are borne on unarticulated pedicels, the petals are valvate in aestivation, and the ovaries are (2- to)5- to 12-carpellate. The fruits are drupaceous, and the styles are as many as the carpels in number and are free or united basally or throughout into a distinct column (Nevling, 1959; Cannon & Cannon, 2001, 2009; Shang & Lowry, 2007).

A recent phylogenetic study, based on molecular sequence data obtained from both nuclear (ITS) and plastid (*atpB-rbcL*, *ndhF*, *psbA-trnH*, *rpl16*, *rps16*, *trnL-trnF*) markers, placed all but two species of *Dendropanax* in a strongly supported clade (parsimony bootstrap value = 99%, Bayesian posterior probability = 1.0), with the Neotropical and Asian members comprising two likewise well-supported subclades (parsimony bootstrap value = 87%–99%, Bayesian posterior probability = 1.0) (Li & Wen, 2013). Two Asian species, *D. lancifolius* (Ridl.) Ridl. and *D. hainanensis* (Merr. & Chun) Chun, were placed outside of the core *Dendropanax* clade, but this was regarded as a possible artifact of sampling bias, and the most parsimonious tree constrained to include all species of *Dendropanax* was only a single step longer. Given the high level of morphological homogeneity within *Dendropanax* as currently circumscribed to include these two species, it seems likely that further studies with an expanded sampling, especially from the Caribbean region, will confirm the monophyly of the genus.

Recent botanical inventory work, conducted in the Donoso District of Panama in support of an environmental impact assessment and biodiversity management program for a large copper mining project being implemented by Minera Panamá S.A. (MPSA), has revealed the presence of a diverse and interesting flora in this previously under-explored area of the Caribbean slope (MPSA & Missouri Botanical Garden, 2015). Several new species have been described based on collections resulting from this work, including *Blakea unguiculata* Almeda & Penneys (Melastomataceae), *Cryptocarya panamensis* P. L. R. Moraes & van der Werff (Lauraceae), *Miconia mcphersonii* Almeda & Penneys (Melastomataceae), *Pleurothyrium triflorum* van der Werff (Lauraceae), *Posoqueria laevis* C. M. Taylor (Rubiaceae), and *Strychnos puberula* McPherson (Loganiaceae). Here we describe another novelty from the Donoso District, *Dendropanax pachypedunculatus* Idárraga & Lowry, which joins *Schefflera coclensis* M. J. Cannon & Cannon as the second Araliaceae of restricted range known from the area.

Dendropanax pachypedunculatus Idárraga & Lowry, sp. nov. TYPE: Panama. Colón: westernmost part of province, site of proposed copper mine (INMET), tailings area, lowland forest, 08°52′10″N, 80°40′00″W, 75 m, 13 Apr. 2009 (fr.), *G. McPherson & J.-Y. Serein 20918* (holotype, PMA; isotypes, HUA, MO, US). Figure 1.

Haec species *Dendropanaci arboreo* (L.) Decne. & Planch. similis, sed ab eo inflorescentiae axe primario crassiore (ad basem 5–7 mm vs. 2.5–5 mm), pedunculis (inflorescentiae axibus secundariis) brevioribus crassioribusque (10–16 × 1.6–2.2 mm vs. 15–40 × 0.6–1.2 mm), foliis pinnativerviis (vs. plerumque triplinerviis) atque fructu majore distinguitur.

Tree to 25 m tall; branches 5–6.4 mm diam., longitudinally striate and opaque white. Leaves alternate, spirally arranged; stipules to ca. 2.3 mm, margin entire; petiole 0.5–3.8 cm, not exceeding apex of stem; blade spreading, plane, smooth, coriaceous, 6.7–13.2 × 2.2–6.2 cm, elliptic, symmetric to slightly asymmetric, base cuneate, margin entire, apex caudate or acuminate; venation pinnate, brochidodromous, midvein abaxially prominent, secondary veins in 5 to 8 pairs, prominent abaxially; intersecondary veins present, noticeably less prominent than secondaries, angle to midvein similar to or less than that of secondaries, tertiary veins and higher order reticulation conspicuous abaxially. Infructescences terminal, erect, each a raceme of umbels; primary axis 2.1–2.7 cm × ca. 5–7 mm diam. at base, tapering to 3.5–4 mm diam. at apex; secondary axes (peduncles) 12 to 15, five or six borne terminally, the others inserted ± uniformly along primary axis, ca. 10–16 × 1.6–2.2 mm, each subtended by a stiff, persistent, broadly triangular, adaxially concave (nearly cupuliform) bract 1.7–3.2 × 2.6–3.3 mm; peduncles unarticulated, usually with 1 or 2 reduced, adaxially concave bracts near midpoint; peduncles terminating in a simple umbel of 4 to 6 fruits, pedicels 5–8 mm, each subtended by 1 or 2 fleshy, persistent, broadly triangular bracts. Flowers unknown. Fruits pinkish purple, fleshy, subglobose, 7- to 10-carpellate, with as many ribs when dry, 3.4–6.8 × 3.8–7.2 mm, styles fully united, forming a column ca. 2 mm long; disk 2–2.9 mm in diam.; pyrenes 7 to 10, ca. 6 × 3 mm.

Distribution and habitat. *Dendropanax pachypedunculatus* is endemic to Panama and is known only from lowland forest at elevations at about 75 m on the Caribbean slope of the Donoso District of Colón Province.

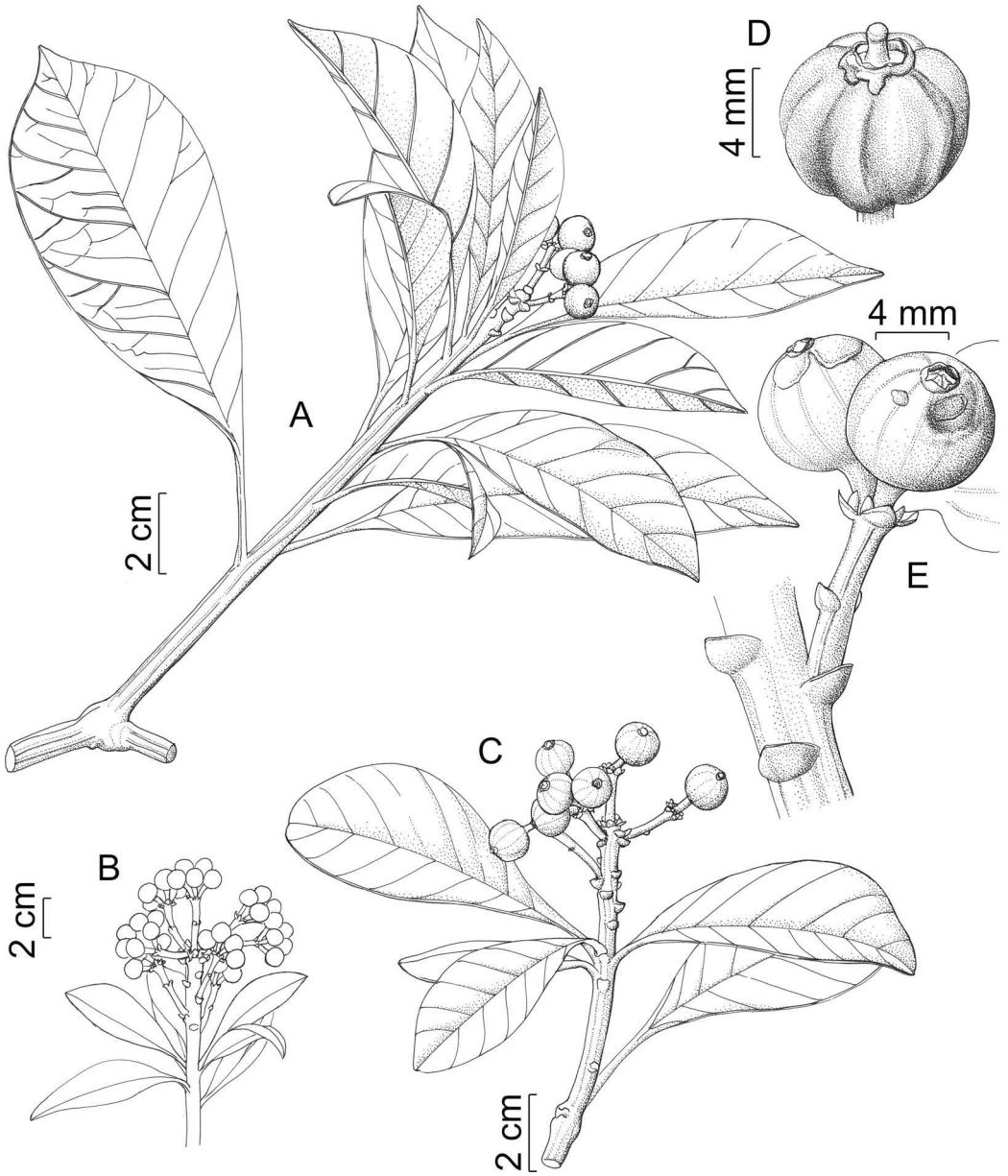

Figure 1. *Dendropanax pachypedunculatus* Idárraga & Lowry. —A. Branch with leaves and mature fruit. —B. Schematic illustration of infructescence with all fruits inferred as present. —C. Infructescence with only some fruits remaining. —D. Detail of mature fruit in vivo and infrutescence axes. —E. Detail of fruit in seco. Illustration by B. Alongi, based on the type, *G. McPherson & J.-Y. Serein 20918* (MO).

IUCN Red List category. The new species is known only from the type collection, which was made within the footprint of MPSA's proposed copper mine. The forest at this site is scheduled to be cleared within the next several years, which will result in a 100% reduction in population size within the next three generations (estimated at 45 years, based on a generation time of 15 years). The area of occupancy (AOO) of *Dendropanax pachypedunculatus* is just 4 km^2, and the species is known from only a single location, which yields a risk of extinction assessment of Critically Endangered (CR A3c; B2ab[ii,iii,iv,v]),

at least until and unless the species can be located at one or more secure sites outside the area impacted by the mining.

Etymology. The specific epithet of *Dendropanax pachypedunculatus* refers to the thickness of its peduncles, a key character that differentiates it from other Central American species of *Dendropanax*, including the co-occurring *D. arboreus*.

Discussion. Using the key provided by Cannon and Cannon (2009), material of our new taxon would be identified as one of the following Central American species: *Dendropanax arboreus*, *D. panamensis* M. J. Cannon & Cannon, *D. praestans* Standl., *D. punctatus* M. J. Cannon & Cannon, or *D. ravenii* M. J. Cannon & Cannon. *Dendropanax pachypedunculatus* can, however, be distinguished from each of these species by several features (see Fig. 1). It differs from the widespread and rather polymorphic *D. arboreus* by its thicker primary inflorescence axis (5–7 mm in diam. at the base vs. 2.5–5 mm in *D. arboreus*), shorter and thicker peduncles of secondary axes (10–16 × 1.6–2.2 mm vs. 15–40 × 0.6–1.2 mm in *D. arboreus*), the large size of its fruits (3.5–6.8 × 3.8–7.2 mm vs. 3–4(–6) × 2–4(–6) mm) and pinnately veined leaves (vs. mostly triplinerved in *D. arboreus*). The new species can be distinguished from *D. panamensis*, known only from rainforest at Cerro Azul, Cerro Jefe, and Altos de Pacora to the northeast of Panama City, by its longer pedicels (exceeding 5–8 mm vs. shorter in *D. panamensis*), its arborescent habit (vs. shrubby habit in *D. panamensis*), and its presence in lowland forest below 100 m (vs. 500 m or above in *D. panamensis*). *Dendropanax pachypedunculatus* differs from *D. praestans*, a species of lower montane rainforest and cloud forest of Panama and Costa Rica, by its shorter pedicels (5–8 mm vs. 10–18 mm), unlobed (vs. commonly lobed) leaves, and completely united (vs. free) styles. Several features separate *D. pachypedunculatus* from *D. punctatus*, a species of mid-elevation and premontane forest in Panama and Costa Rica, including the absence of pellucid dots (very conspicuous in *D. punctatus*) and fully united styles forming a column (vs. free and recurved in *D. punctatus*). Finally, the leaves of *D. pachypedunculatus* are similar to those of *D. ravenii*, known only from low-elevation rainforest on the Osa Peninsula in southwestern Costa Rica, but the blades are coriaceous and lack red dots in *D. pachypedunculatus*, whereas those of *D. ravenii* are chartaceous and bear evident red pellucid dots. Careful comparison of the type material of *D. pachypedunculatus* with specimens of *Dendropanax* from Colombia deposited in HUA, MO, and NY shows that it does not correspond to any species known from that country.

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